

REMARKS

The last Office Action has been carefully considered.

It is noted that claims 1, 3-5 and 7-9 are rejected under 35 U.S.C. 103 over the U.S. patent to Grahn, international patent document WO (169) and European patent document (454).

The Examiner also indicated that the subject matter of claim 7 is not shown in the drawings.

With the present Amendment applicant has submitted a copy of the drawings with the proposed correction, in which a saw tooth generator connected to the piezoelectric element 18 is shown. The Examiner is respectfully requested to approve the drawing, whereupon applicant will be glad to amend the drawing and the disclosure correspondingly.

Before the analysis of the prior art it is believed to be advisable to explain again the subject matter of the present invention. In order to more clearly explain the construction and the operation of the inventive device, a photo is submitted herewith showing the elements of the device. The rotor

11 is arranged between two side bearing blocks 12, 13 which are connected by a block element 14. The side bearing block 12 carries a ring element (rotor receptacle) 16 which can be rotated relatively to the side block 12. This rotary movement is caused by one single piezo electric element 18. A rubin ball 20 fastened to one side of the rotor 11 is inserted into the ring element 16. On the other side of the rotor 11 shows an opening 21 in which a small rubin ball 22 of the side bearing block 13 is inserted. Therefore the rotor 11 is rotatably mounted between the two side bearing blocks 12, 13.

The friction between the ring element 16 and rubin ball 20 is such that the rotor 11 does not follow relatively rapid movements but follow relatively slow movements. This friction is always constant. Therefore the rotor 11 can be continuously rotated by alternating slow and rapid movements of ring element 16.

The driving principles disclosed in the references EP 0 112 454 and WO 98/18169 are quite different compared with that. According to the state of the art the rotor is not mounted between two side bearing blocks but mounted in ring shaped elements arranged in the middle of the rotor. Two of the ring shaped elements carry piezoelectric elements which contract and expand in a radial direction therefore clamping or releasing the rotor. A third

ring element carries a piezoelectric element acting transversely on the rotor therefore causing the rotor to rotate. When the first ring element releases the rotor the second ring element clamps it and rotates it together with the third element. Then the first ring element clamps the rotor and the second and third ring elements releases the rotor and are rotated back. In the original position they clamp and rotate the rotor again while the first ring element releases the rotor.

This kind of rotating the rotor is similar to the rotation of a rod with two hands: Both hands are put around the rod. While one hand grasps and turns the rod the second hand only guides the rod without grasping it. Then the second hand grasps the rod and the first hand is loosened and turns back before grasping and rotating the rod again. Therefore the friction between the ring elements and the rotor is permanently changed.

This driving principle according to the state of the art has several disadvantages: it needs at least 3 piezoelectric elements, one for each of the three ring elements. Further, the rotor is not secured against axial or tilt movements. The actuator according to the present invention needs only one piezoelectric element. The rotor is completely secured against axial shifts of tilt movements. And it is made with only very few

elements.

The new features of the present invention which are now defined in claim 1 are not disclosed in the references and can not be derived from it as a matter of obviousness.

Claim 11 submitted in the present Request for Reconsideration defines only one peizoelectric element, and therefore the features of this claim are definitely not disclosed in the prior art and can not be derived from it as a matter of obviousness.

Finally, claim 10 defines an electromechanical drive element which combines the features of the original claims 1 and 5. The features of claim 10 are also not disclosed in the prior art and derived from it as a matter of obviousness.

The above mentioned claims should be considered as patentably distinguishing over the art and should be allowed.

As for the dependent claims, these claims depend on claim 1, the share its presumably allowable features, and therefore it is respectfully

submitted that they should be allowed as well.

Reconsideration and allowance of the present application is most respectfully requested.

Should the Examiner require or consider it advisable that the specification, claims and/or drawings be further amended or corrected in formal respects in order to place this case in condition for final allowance, then it is respectfully requested that such amendments or corrections be carried out by Examiner's Amendment, and the case be passed to issue. Alternatively, should the Examiner feel that a personal discussion might be helpful in advancing this case to allowance, he is invited to telephone the undersigned (at 631-549-4700).

Respectfully submitted,



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